CONSERVATION PRACTICE STANDARD

WATERING FACILITY
(No.)
CODE 614

DEFINITION

A device (tank, trough, or other watertight container) for providing animal access to water.

PURPOSE

To provide watering facilities for livestock and/or wildlife at selected locations in order to:

- protect and enhance vegetative cover through proper distribution of grazing;
- provide erosion control through better grassland management; or
- protect streams, ponds and water supplies from contamination by providing alternative access to water.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all land uses where there is a need for new or improved watering facilities.

CRITERIA

General Criteria Applicable To All Purposes

A trough or tank shall have adequate capacity to meet the water requirements of the livestock and/or wildlife. This will include the storage volume necessary to carry over between periods of replenishment. Animal water requirements can be obtained from the NRCS Engineering Field Handbook, Table 11-1.

Where water supplies are dependable and livestock are checked daily, troughs with little water storage capacity may be used. Troughs or tanks must provide the daily water requirement of the livestock and provide access to the entire herd within a short period of time.

The site shall be well drained; if not, drainage measures shall be provided. Areas adjacent to the trough or tank that will be trampled by livestock shall be graveled, paved, or otherwise treated to provide firm footing and reduce erosion. Design of the protective surface around the trough shall be in accordance with NRCS Conservation Practice Standard 561, Heavy Use Area Protection.

Automatic water level control and/or overflow facilities shall be provided as appropriate. Valves or pipes shall be protected by shields or covers to prevent damage by livestock. Overflow shall be piped to a stable or suitable point of release. The trough and outlet pipes shall be protected from freezing and ice damage. Freeze-proof troughs or electric heaters may be used.

When a roof is placed over the trough to provide shade, the roof shall be designed for appropriate snow and wind loads and shall be durable to withstand anticipated livestock and wildlife activities.

All materials shall have a life expectancy that meets or exceeds the planned useful life of the installation. Common construction materials are reinforced concrete, steel, fiberglass, plastic and wood. All designs shall meet the industry standards for the material being used. Generally applicable design requirements and procedures can be found in the documents referenced at the end of this standard.

Concrete structures shall be constructed from a concrete mix producing a minimum compressive strength of 3,000 psi at 28 days. Galvanized steel tanks shall have a minimum thickness of 20 gauge. Plastic and fiberglass structures shall be made of ultraviolet resistant materials or shall have a durable coating to protect the structure from deterioration due to sunlight.

CONSIDERATIONS

This practice may adversely affect cultural resources and must comply with GM 420, Part 401.

Topography should be evaluated to minimize trail erosion and flooding erosion from tank overflow.

Watering facilities should be accessible to small animals. Escape ramps for birds and small animals should be installed.

Adequate protection for livestock during the winter should be considered.

PLANS AND SPECIFICATIONS

Plans and specifications for installing troughs and tanks shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. If the trough and/or tank is a component of a system that includes additional conservation practices, the information necessary to construct these additional practices will also be conveyed on the plans.

Development of plans will be guided by Engineering Field Handbook, Chapter 5, and shall be in accordance with National Engineering Manual, Parts 541 and 542.

OPERATION AND MAINTENANCE

An O&M plan specific to the type of installed trough or tank shall be provided to the landowner. The plan shall include, but not be limited to, the following provisions:

- check for debris, algae, sludge or other materials in the trough which may restrict the inflow or outflow system;
- check for leaks and repair immediately if any leaks are found;
- check the automatic water level device to insure proper operation;
- check to ensure that adjacent areas are well protected against erosion;
- check to ensure the outlet pipe is freely operating and not causing erosion problems; and
- prepare guidance for winter weather, such as adding material in the storage area to allow for ice expansion without damage.

Algae and iron sludge accumulation should be addressed in areas with water quality that is known to cause problems. Chemicals such as copper sulfate and chlorine can be recommended as needed, as long as local rules and regulations are followed.

REFERENCES

Engineering Field Handbook

National Engineering Manual

Manual of Steel Construction, American Institute of Steel Construction

Timber, National Design Specification for Wood, American Forest and Paper Association

Concrete, ACI 318, American Concrete Institute

Masonry, Building Code Requirement for Masonry Structures, ACI 530, American Concrete Institute

TROUGH OR TANK
CONSTRUCTION SPECIFICATION

The foundation area shall be cleared of organic matter and all other unsuitable material. When backfill is required to establish planned grade lines the backfill shall be compacted by hand-operated compaction equipment.

The foundation area and the immediately surrounding area shall be smoothed and graded to permit free drainage of surface water.

All materials, placement, anchoring, proportioning and protection shall be as shown on the plans. Concrete shall be of a quality to produce a 28-day compressive strength of 3000 psi. If the supplier cannot show evidence that his mix will meet strength requirements he may use a mix with a maximum net water content of seven gallons per bag (94#) of cement and a minimum cement content of six bags per cubic yard of concrete. Aggregates are to be proportioned to produce a workable mix.

All backfill for underground pipes shall be compacted to the degree required to prevent caving after construction is completed.

All construction shall be performed in a workmanlike manner and the job site shall have a neat appearance when finished.

Precast concrete, galvanized metal, and masonary structures are acceptable when their design and construction have been reviewed and approved. Bathtubs are not acceptable material for troughs or tanks.

Erosion and Pollution Control

Construction operations will be carried out in such a manner so erosion and air and water pollution will be minimized. State and local laws concerning pollution abatement shall be followed.

Seeding

Sodding, seeding, fertilizing, and mulching shall conform to the recommendations for permanent seeding in the Pennsylvania Technical Guide which is available in NRCS offices or in the current Pennsylvania Agronomy Guide published by The Pennsylvania State University.

TROUGH OR TANK

DESIGN AND CHECK DATA REQUIREMENTS

Design Data

Record in Engineering Field Book or on Form PA-ENG-4 or other approved worksheet.

1. Slope of pipeline or difference in elevation between inlet in collection box and overflow in tank.
2. Type and dimensions of spring box, pipeline, and tank.
3. Type and size of overflow disposal system.
4. Method of stabilizing area adjacent to trough/tank.

Check Data

Record in Engineering Field Book or on Form PA-ENG-4 or other approved worksheet.

1. Dimensions of pipelines, spring box, watering trough, or other appurtenances.
2. Relative elevation or slope between spring box and tank.
3. Installation of material to stabilize area adjacent to trough/tank.

Items of Performance that Can be Certified by the Cooperator

1. Seeding, sodding, or establishment of vegetation.
2. Fencing when it is required.

Special Conditions

When unusual conditions are present so PA-ENG-4 is not adequate for showing the design of the practice, standard engineering paper and principles given in Chapter 5, "Engineering Field Manual for Conservation Practices," shall be used in preparing the plans.